IS IT SAFE?

Objectives:
Students will:

- evaluate that just because water looks clean does not mean that it is, there are pollutants that we cannot see but are present;
- they will begin to analyze the challenges of managing water systems

Materials:

- 2 gallons distilled water
- 1 empty and washed gallon milk jug
- Salt or sugar
- Grease pencil or washable marker
- Cups so that each student has 2
- Copy of attached story

Procedure:

1. Before class, add salt or sugar to one of the gallons of distilled water and make sure that you can taste it, but that it is all dissolved and not visible.
2. Fill the other jug with tap water.
3. Label the jugs A and B
4. Ask one of the students to read Part I of the attached story.
5. Pass out 2 cups to each student and have them label the cups A and B. Have the students pour a small amount of the A jug into their A cup and a small amount of the B jug into their B cup. They should have enough to swallow.
6. Have the students inspect the water and see if they can tell any difference. Let them know that they are going to taste the water but it will not be harmful (VERY IMPORTANT! **Tell students to NEVER taste something if they don't know what it is**. You have set up the experiment and have prepared the test so you know exactly what is in the jugs. Repeat this information!!!!!)
7. Have them sip from both of the glasses. Did their guesses match what they tasted? Was there a taste to either glass of water? Did it look like there would be?
8. Ask a student to read Part II of the story. Encourage further discussion.

Discussion:

- What does this experiment tell you about our drinking water?
- What do treatment facilities have to do to water to make it safe and look clean?
- How would this apply to noticing if there were harmful pollutants in the water?
- Is pollution always mucky and brown?
- Will taste always reveal pollution as it did in this experiment?
- What might happen to a person who consumes drinking water over a long time that contains contaminants they are unaware of? Has this ever happened?
- How do you know your drinking water is safe?

The story, taken from McCall's Health, March 1999

Last June, 30-year-old Tammy Lowery of Alpine, WY, had no idea that she was dangerously close to death. Suffering from diarrhea, Lowery thought she had the flu. As the week wore on, she endured wrenching stomach pains, bloody stools and paralyzing cramps. By the fifth day she couldn't even stand up straight. "I had natural childbirth twice and a complete hysterectomy, but nothing compared to this kind of crippling pain," Lowery says. When she noticed her five-year-old son holding his stomach, she called her physician, Donald Kirk, MD, who told her to come to his office immediately with her children.

Moments after she arrived, Lowery started to feel wobbly. "Catch her, she's going down!" Lowery remembers hearing Kirk yell. When she came to, she was on a gurney, hooked up to an IV, about to be rushed to the nearby hospital. Lab tests confirmed Lowery was carrying *E. coli* 0157:H7 – the most deadly strain. This bug behaves savagely, producing toxins that damage blood vessels in the intestines and kidneys, which can cause the kidneys to shut down. Thankfully Lowery regained most of her kidney function after a three-day hospital stay. "When I found out I had *E. coli* I couldn't believe it," says Lowery. "I'm so careful in the kitchen. So how could this happen?"

Part II:

Lowery was shocked to learn that the water from her faucet was the source of the deadly germs. In fact, 64 people were confirmed to be infected (more than became ill) and 19 were hospitalized. The small town of Alpine was not required by law to treat the spring that supplied the town's water because regular monitoring showed it to be safe. But when animal waste washed into the spring, bacteria coursed through Alpine's pipes, according to Chuck Higgins, manager of Consumer Heath Services with Wyoming's Department of Agriculture and the official in charge of tracing the source of the outbreak. While one person can get a whopping infectious dose from tap water, another may be able to dodge the bug – as was the case with Lowery's husband and daughter.

Over a two-month period, Lowery's health gradually returned to normal. Her son, who suffered a mild bout, also recovered completely. Though Alpine's water supply is now from a chlorinated well system, Lowery hasn't put the trauma totally behind her. "I'm still a little nervous so I use an in-home water-purification system to give me extra piece of mind," she says. (Remember, though: Not all of these systems kill bacteria.)

Is your tap water safe? Probably, since water from the majority of public systems is regularly disinfected, usually with chlorine, and checked for pollutants. Plus, by law, your local water utility must send you a detailed report on the safety and quality of your tap water by the end of this year. Meanwhile, call your local health department or check for information on the internet if you would like to find out about the source of your drinking water and how it's treated or if you need help monitoring a private well.